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Extending and Applying the Demand–Control Model: The Role of Soldier's Coping on a Peacekeeping Deployment

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The purpose of this study was to extend the demand–control model (R. A. Karasek, 1979) by examining coping as an additional factor. It was hypothesized that perceived job control only buffered the demand-strain relationship when individuals used active coping and exacerbated the relationship when individuals used passive coping. Soldiers ($N = 638$) were surveyed before and during a 6-month peacekeeping deployment to Kosovo. Results partially confirmed the hypotheses. Even after controlling for general psychological health at predeployment, job control moderated the relationship between demands and psychological health during deployment when soldiers used active coping. No significant 3-way interactions were found for religious coping and passive coping. Implications for demand–control modeling and potential applications of the findings to soldier and leader training are discussed.

Keywords: demand–control model, coping, peacekeeping, deployment stress

The demand–control model (Karasek, 1979) proposes that job control buffers the effect of job demands on workers' strain and thus well-being. Several researchers have applied the model to different settings, examining both physiological and psychological health outcomes (see Van der Doef & Maes, 1999, for a review). Although job control was found to moderate the impact of job demands on strain, researchers have criticized Karasek's model as being too simplistic and thus leading to inconsistent findings (Rodríguez, Bravo, Peiró, & Schaufeli, 2001). For instance, the Van der Doef and Maes (1999) review found the buffering hypothesis was replicated in only half of the reviewed studies and sometimes only in specific subsamples.

Researchers have extended the model with individual characteristics as suggested by Van der Doef and Maes (1999). One of these studies identified the potential for an active coping style to moderate the demand–control relationship (de Rijk, Le Blanc, Schaufeli, & de Jonge, 1998). De Rijk et al. found that job control was only able to buffer the relationship between intensive care nurses' job demands and their emotional exhaustion when the nurses engaged in an active coping style. In the de Rijk et al. study, active coping was assessed as a unidimensional construct; other dimensions of coping were not assessed (e.g., passive coping). The aim of the present study is to examine the impact that job control has on peacekeeping soldiers facing deployment stressors and how their coping strategies—their individual approaches to stressful events—influence the demands–job control interaction.

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Coping

According to Folkman (1984), *coping* refers to "cognitive and behavioral efforts to master, reduce, or tolerate the internal and/or external demands that are created by a stressful event" (p. 843). Basically, this means that if a stressful incident occurs a person has to do something in order to deal with the problem. Although findings regarding different coping strategies and their potential effects are not completely consistent, some trends can be found in the coping literature. Previous research has found that active coping strategies (e.g., problem-oriented coping) buffered the impact of stress on mental health outcomes (Jex, Bliese, Buzzell, & Primeau, 2001; Wanberg, 1997). On the other hand, use of avoidant coping strategies has typically been found to be disadvantageous (e.g., Jex et al., 2001).

These two primary coping strategies do not cover all aspects of how people deal with demands. A new trend in the literature is to incorporate people's religiosity into the construct of coping. Recent research has underscored the importance of including religion in studies of the impact of coping on physical (Powell, Shahabi, & Thorensen, 2003) and psychological health (Miller & Thoresen, 2003). Religion has been repeatedly linked with a wide range of positive health outcomes (Miller & Thoresen, 2003) despite the lack of clarity as to how to conceptualize its impact on health (Hill & Pargament, 2003). Although religious coping has been demonstrated to have relevance in explaining how individuals cope with stress, it appears to be independent of the constructs of active and passive coping and must therefore be included in any comprehensive assessment of coping styles.

Job Control

Given the contrast between the two traditional coping strategies, active and passive coping, the question of how job control interacts with these coping styles becomes relevant. Job control is a complex construct. Ganster (1989) defines *job control* as "the ability to exert some influence over one's environment so that the environment becomes more rewarding or less threatening" (p. 3). Although job control has been operationalized in a variety of ways (cf. de Jonge, Dollard, Dormann, Le Blanc, & Houtman, 2000; Jackson, 1989) and may consist of several components including self-determination (Kristensen, 1991) and goal setting (Frese, 1989), it is usually defined as a form of job autonomy (cf. Sauter, Hurrell, & Cooper, 1989).

Despite the fact that Karasek's (1979) conceptualization of job control (or *decision latitude*) has been criticized (e.g., Ganster & Fusilier, 1989; Wall, Jackson, Mullarkey, & Parker, 1996), Karasek conceptualized job control as including decision authority (e.g., "freedom as to how to work," p. 307) and related his job control measure to Hackman and Oldham's (1975) concept of *job autonomy*. In fact, decision authority is comparable in definition to the concept of job autonomy (Karasek, 1989; Smulders & Nijhuis, 1999) or the degree to which there is freedom and discretion in the way in which a job is accomplished (Hackman & Oldham, 1975). Even though some researchers have disagreed with this conceptualization of job control (e.g., Frese, 1989), other researchers also have operationalized job control as job autonomy (e.g., Morrison, Payne, & Wall, 2003; Parker, Axtell, & Turner, 2001; Rodríguez et al., 2001) and confirmed that job autonomy is linked to positive work-related outcomes (e.g., Kelloway & Barling, 1991; Spector & Jex, 1991).

In operationalizing job control for the present study, we selected job autonomy as a measure of job control for three reasons. First, job autonomy is a critical component of job control (Ganster, 1989; Jackson, 1989; Karasek, 1989). Second, job autonomy has been demonstrated in previous research to correlate with important work-related and health outcomes (Parker, Axtell, & Turner, 2001). Third, job autonomy was selected because it is potentially within the control of military personnel and their leaders, whereas other aspects of job control may not be (e.g., lack of monotony, work goals).

Given the potential usefulness of job control in moderating the impact of work demands on health, we wanted to examine the impact of coping styles on the demand–control model. In the case of individuals who use active coping, job control is expected to buffer against work demands because these individuals are prone to taking advantage of the potential benefits of perceived job control. In the case of individuals who use passive or avoidant coping, however, job control is not expected to buffer against work demands because these individuals tend not to take advantage of the potential benefits of their perceived job control. Besides the general lack of buffering by job control expected for passive copers, passive copers who experience low job control are expected to do even worse because they are not only disinclined to cope by changing a stressful situation but are also not easily able to cope given their perception of no job control. In fact, Dwyer and Fox (2004) have argued that the perception of job control

alone has an influence on stress levels, even if the individual does not use his or her control. Therefore, although not specifically examined in the existing literature on the demand–control model, when individuals engage in passive coping, job control would be expected to exacerbate the demand–health relationship. Finally, although in the literature religious coping appears to function as a distinct coping factor (Carver, Scheier, & Weintraub, 1989), it is not yet known how it interacts with environmental variables such as job control and will therefore be treated as an exploratory question in the present study.

Demands

In the demand–control model, demands are generally conceptualized as *workload* (e.g., "requires working hard," "not enough time;" Karasek, 1979) and have been found to influence worker ratings of exhaustion and depression. However, Karasek also conceptualized job demands as including "psychologically demanding" (p. 291) stressors, and other studies have maintained this broader conceptualization of job demands. For example, in their study of the demand–control model with postal service employees, Eriksen and Ursin (1999) operationally defined job demands as including communication, leadership, workload, and relocation stressors. In another study testing the demand–control model, de Jonge et al. (2000) operationalized job demands as workload, physical demands, and emotional demands. Defined in these ways, job demands are conceptualized as job-related stressors; however, some researchers have interpreted job demands more narrowly, referring exclusively to workload stressors (Van der Doef & Maes, 1999).

Although workload may be a useful generic stressor, every sample of workers also has unique work-related demands. In every new study, the unique demands must be identified and adapted for use with the particular sample being assessed. For the sample in this study, the focus is on demands experienced by soldiers deployed in a peacekeeping environment.

Peacekeepers experience a wide range of demands varying in intensity from nontraumatic daily hassles to potentially life-threatening situations (see Adler, Litz, & Bartone, 2003, for an overview). Peacekeepers in the present study were deployed during the fourth year of the military operation in Kosovo and, as such, the theater of operations was relatively stable and mature, lacking frequent traumatic stressors. Thus, we focused the present study on work-related and personal demands associated with deployment. It is important to point out the special nature of the demands associated with a military deployment in comparison to other job situations (e.g., an office job). During the deployment soldiers are on their job "24/7." For example, the range of demands soldiers encounter is much greater than those encountered in a "9-to-5" job.

Work-related demands on deployment include boredom, long workdays, and cultural deprivation (Harris & Segal, 1985). Additionally, deployed soldiers experience personal demands including separation from their families and difficulty communicating back home. Furthermore, Adler et al., (2003) described variables related to the physical environment, such as not getting enough sleep and harsh weather conditions, as other sources of daily demands to be endured by deployed military personnel. In previous studies, these deployment-related nontraumatic daily hassles have been related to decreased well-being (Day & Livingstone, 2001; MacDonough, 1991).

Outcome

In the original demand–control model (Karasek, 1979), *strain* was conceptualized as either exhaustion or depression. Subsequent research has continued to measure strain as a key outcome in the demand–control model. Indeed, according to Jex and Beehr (1991) psychological strain is the most typical outcome used in stress research. In the present study, psychological strain was assessed by a measure of general psychological health.

We hypothesized as follows:

> *Hypothesis 1.* When soldiers engage in active coping, job control buffers the demand–strain relationship.
>
> *Hypothesis 2.* When soldiers engage in passive coping, job control exacerbates the demand–strain relationship.

Religious coping will also be assessed within the demand–control model, although no specific hypothesis was developed.

Method

Sample

The sample in this study comprised 638 U.S. soldiers from a brigade stationed in Germany who were surveyed

prior to and during a 6-month peacekeeping deployment to Kosovo. Among the soldiers surveyed, 66% were junior-enlisted soldiers, 29.5% were noncommissioned officers (NCOs), and only 4.5% were officers and warrant officers (WOs). The mean age of the sample was 25.53 years. The majority (97%) was male, and 3% were female. Soldiers primarily came from combat arms units (76.8%). The rest of the sample came from noncombat arms units assigned as support (23.2%). This brigade is representative of other U.S. Army brigades from active duty divisions.

Measures

Except for the measure of general psychological health, all measures were assessed during the deployment to Kosovo. General psychological health was measured twice, both in garrison before soldiers deployed and during deployment.

Demands were assessed with the Deployment Stressors Scale (α = .92; Adler, Litz, Castro, Wright, & Thomas, 2001). The Deployment Stressors Scale was developed through a series of studies (e.g., Bartone, Adler, & Vaitkus, 1998; Castro, Bienvenu, Huffman, & Adler, 2000) in which subject-matter experts provided demand items. These items were then administered to U.S. peacekeepers in the Balkans, and interviews conducted with these soldiers resulted in additions and changes to the scale (e.g., Bienvenu, Huffman, Adler, & Castro, 1999). Previous studies have demonstrated the construct validity of the deployment stressors (Bartone, et al., 1998). The resulting scale consists of 27 items covering the issues of family (e.g., *being separated from family during important days*, *difficulties getting phone calls through*), work (e.g., *sense of not being appreciated by the local nationals*, *long duty days*), and physical conditions (e.g., *not getting enough sleep*, *physical workload*, *concerns about disease*). Soldiers were asked to "rate how much trouble or concern is caused by" any of the stated events. The ratings were given on a 5-point scale ranging from 1 (*very low*) to 5 (*very high*), with an option for *does not apply*.

The coping scale (Harnish, Aseltine, & Gore, 2000) used in this study integrates items from several other scales. Overall, it contains 24 items covering six different coping styles. The six styles are active cognitive coping with a Cronbach's alpha reliability of .77 in this sample (e.g., *try to anticipate how things would turn out*), positive reappraisal (α = .75; e.g., *look for something good in what was happening*), active behavioral coping (α = .75; e.g., *do things to improve the situation*), avoidant coping (α = .69; e.g., *do things to take your mind of the situation*), social support (α = .84; e.g., *talk to someone about how you felt*), and religious coping (α = .93; e.g., *trust that God would work things out*). On a 4-point scale ranging from 1 (*a lot*) to 4 (*not at all*), participants had to indicate how much they used the given strategies for each item. Responses were recoded in the same direction such that higher numbers indicated greater use of that particular type of coping.

The Job Control Scale was adapted from the autonomy subscale of the Job Diagnostic Survey (α = .79; Hackman & Oldham, 1975) and contains three items. On each item, soldiers had to rate their agreement or disagreement on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

For psychological health, the General Health Questionnaire (GHQ; Goldberg, 1972) was used (α = .84 at Time 2 and α = .82 at Time 1; Goldberg, 1972). The scale includes 12 items. Soldiers had to rate how often they experienced the given psychological symptoms in the past 2 weeks on a 4-point scale ranging from 0 (*not at all*) to 3 (*much more than usual*). This short version of the GHQ has proven to have excellent reliability and validity (Goldberg et al., 1997). Items were recoded such that higher numbers indicated better health.

Procedure

Data collection took place in garrison (predeployment) and in Kosovo (during the deployment). Soldiers were first surveyed 30 days before they deployed to Kosovo. The second data collection took place in Kosovo toward the end of the 6-month deployment, before soldiers returned to garrison. Soldiers were all volunteers who provided their informed consent. All the data were collected under an approved human use research protocol and were treated confidentially. Soldiers were surveyed both individually and in groups of up to 100 people. The survey lasted about 45 min.

Analytical Strategy

The first step in the data analysis was to confirm the factor structure of the coping scale in order to be certain of the major coping style categories for this sample. The new factor structure was the basis for further analyses, and descriptive statistics were reported through the use of the new factor structure. The hypotheses were analyzed by a hierarchical moderated regression and included a three-way interaction in the fourth step. In order to control for the effects of psychological health at predeployment on psychological health assessed during the deployment, Time 1 psychological health was entered first in the series of regression equations as a covariate. All analyses were conducted in SPSS 11.0 for Windows.

Results

Factor Analyses

The factor structure of the coping scale was assessed in order to determine what relevant coping factors emerged during a 6-month peacekeeping deployment. A principal-components analysis with varimax rotation was the method used for the extraction. Four components emerged with eigenvalues over 1.0, thus the coping scale possessed a different factor structure in this application (i.e., coping on deployment) compared with its original form (see Table 1). When double loadings occurred for an item, the higher loading was selected for the interpretation of the single factors, as recommended by Tabachnick and Fidell (2001). The four extracted factors for coping on deployment

Table 1
Rotated Factor Component Matrix of the Coping Scale During Deployment

Item	Factor 1	2	3	4
Talk to people about the situation	**.83**	.18	.04	.06
Seek advice about what to do	**.80**	.11	.16	.03
Talk to someone about how you felt	**.69**	.17	.06	.20
Think about strategies for dealing with the situation	**.68**	.20	.30	.18
Talk to others who had similar experiences	**.65**	.24	.18	.09
Put aside other things in order to deal with the situation	**.64**	.14	.24	.28
Try to make light of the situation	**.64**	.17	.23	.22
Do things to prevent the problem from becoming worse	**.57**	.26	**.43**	.14
Go over it in your head to make sure you understood it	**.55**	.24	.27	.28
Seek God's help	.19	**.91**	.13	.05
Rely on your religious beliefs or your faith to help you cope	.24	**.88**	.12	.07
Trust that God would work things out	.22	**.86**	.13	.05
Pray about or meditated on the situation	.22	**.78**	.20	.16
Tell yourself to be grateful things were not as bad as they could be	.28	**.43**	.40	.29
Think about what you would say or do	.39	**.40**	.28	.34
Look for something good in what was happening	.17	.15	**.79**	.00
Do things to improve the situation	.21	.12	**.76**	−.13
Turn to work or other activities to take your mind off of things	.06	.09	**.66**	.35
Try to see things in a positive way	.29	.29	**.62**	−.04
Do things to help you adjust to changes brought on by the problem	.34	.12	**.58**	.32
Try to anticipate how things would turn out	.23	.05	**.49**	.44
Wish that the situation would go away or somehow be over with	.23	.22	.11	**.78**
Daydream or fantasize about other things	.25	.03	−.05	**.75**
Do things to take your mind off the situation	.09	.04	**.44**	**.57**
Eigenvalue	9.50	2.14	1.82	1.47
% variance	39.60	8.93	7.57	6.12

Note. Values in bold indicate high factor loadings.

explained 56.22% variance. The first factor contained items primarily representing seeking social support (e.g., *talk to people about the situation*, *seek advice about what to do*) as well as items addressing active cognitive and behavioral methods of coping (e.g., *think about strategies for dealing with the situation*, *do things to prevent the problem from getting worse*). This first factor was referred to as the s*ocial support and active coping* factor because of the interpersonal and problem-focused nature of the items. This factor had a Cronbach's alpha reliability of .90. The second factor contained items related to engagement in religious activity and was referred to as *religious coping*. It also had a reliability of .90. The item *think about what you would say or do* was excluded because of its relatively low loading on the religious factor and because its content did not match the basic interpretation of the factor. The third factor contained items that reflect positive reappraisal (e.g., *look for something good in what was happening*) as well as items that reflect a positive active coping style (e.g., *do things to improve the situation*). This third factor was labeled bright-side coping factor ($\alpha = .80$) and is primarily a combination of Harnish and colleagues' (2000) original positive reappraisal factor and active coping items. The fourth factor contained three out of the four avoidant coping items in the original scale. These three items all expressed the wish to withdraw from the actual problem. This factor was called *wishful thinking* ($\alpha = .68$). Among the four factors that emerged in this study, wishful thinking was the only one that relied on passive coping strategies.

In sum, the factor analysis of the coping scale resulted in four factors and, thus, differed somewhat from the six original factors found by Harnish et al. (2000). Only the religious coping factor and the avoidant coping factor were similar to the original factor analysis. Items that composed the other four original factors merged into the two factors of social support and active coping as well as bright-side coping.

Intercorrelations

Table 2 provides means, standard deviations and the correlations among all of the study variables. Note that deployment demands significantly correlated (at the .01-level) with general psychological health, and a higher stress level was associated with lower psychological health.

Extension of the Karasek Demand–Control Model

The demand–control model was tested to determine (a) whether job control buffered the relationship between demands and strain if individuals used active coping strategies and (b) whether job control exacerbated the demands–strain relationship when individuals used passive coping. To examine the boundary conditions of the Karasek model, each of the four coping strategies was analyzed for its impact on general psychological health. Before being entered into the regression equations, all predictor variables were grand-mean centered in order to reduce multicollinearity (Aiken & West, 1991). As a first step in the regression equation, general psychological health values at predeployment were entered. Second, the demands, job control, and coping style were entered in the equation. Third, all three possible interactions between the main effect variables were added. Finally, the three-way interaction of demands, job control, and coping was included. The results are presented in Tables 3–6.

Table 3 presents the results for the analysis of social support and active coping as a boundary condition to the demand–control model. The three-way interaction was significant indicating that active coping played a significant role in the demand–control relationship. To better understand the way in which social support and active coping acted as a limiting variable, the interaction was graphed in Figure 1. Differentiating between low and high coping was operationalized by a median split on the coping variable. Then two regression analyses were conducted. One regression included only cases in which people reported the use of high social support and active coping. The second regression included only cases in which low use of social support and active coping was reported. High and low values of the demands were operationalized by using one standard deviation above and below the mean, as recommended by Cohen and Cohen (1983). Figure 1B shows the results of soldiers who reported high use of social support and active coping. It is in this figure that the nature of the interaction between demands and job control can be observed. When soldiers made use of social support and active coping, job control buffered the relationship between demands and psychological health. That is, even under high demands these soldiers reported better psychological health when they perceived high levels of job control than did soldiers who did not report high use of social support and active coping (2.00 in Figure 1B vs. 1.92 in Figure 1A). Also note that when soldiers were experiencing high demands but perceived low job control they seemed to be better off when they did not use an active coping style (1.70 in Figure 1A vs. 1.23 in Figure 1B).

The next coping style that was analyzed for its boundary effects on the Karasek model was bright-side coping. Results are presented in Table 4. There

Table 2
Means, Standard Deviations, and Correlations Among Study Variables Before (T1) and During Deployment (T2)

Variable	*M*	*SD*	1	2	3	4	5	6	7	8
1. Demands T2	2.08	0.68	—							
2. Wishful thinking T2	2.77	0.82	**.35**	—						
3. Bright-side T2	2.83	0.67	.02	**.42**	—					
4. Religious T2	2.42	0.98	.10	**.34**	**.46**	—				
5. Social support and active coping T2	2.51	0.72	**.13**	**.49**	**.60**	**.57**	—			
6. Job control T2	3.62	0.83	**−.24**	**−.17**	**.14**	.06	.00	—		
7. GHQ T1	3.15	0.45	**−.16**	**−.19**	−.09	.01	−.02	**.22**	—	
8. GHQ T2	2.72	0.43	**−.33**	**−.35**	**.15**	.09	.01	**.35**	**.35**	—

Note. Critical value of *r:* $p < .05 = .08$; $p < .01 =$ **.11**; values in bold indicate significance on the 1% level. GHQ = General Health Questionnaire.

Table 3
Hierarchical Regression Analyses for a Three-Way Interaction of Social Support and Active Coping Predicting General Psychological Health

Variable	*B*	*SE B*	β	R^2 change	*p*
Step 1 on GHQ				.12	.00
Time 1 General psychological health	.25	.04	.26		.00
Step 2 on GHQ				.13	.00
Demands	−.11	.02	−.25		.00
Job control	.09	.02	.21		.00
Social support and active coping	.02	.02	.05		.14
Step 3 on GHQ				.01	.11
Demands × Job Control	.01	.02	.03		.34
Demands × Social Support, Active Coping	−.02	.02	−.05		.21
Job Control × Social Support, Active Coping	.02	.02	.06		.10
Step 4 on GHQ				.01	.02
Demands × Job Control × Social Support, Active Coping	.03	.01	.08		.02

Note. General Health Questionnaire (GHQ) adjusted $R^2 = .25$; $F(8, 600) = 26.46$, $p < .01$.

was a significant three-way interaction when predicting general psychological health (see Figure 2). Besides the fact that high job control was associated with better health under low as well as high demands, job control did not moderate the demands–strain relationship when individuals reported low use of bright-side coping (Figure 2A). However, when soldiers reported using high levels of bright-side coping, job control did moderate the relationship between demands and health (Figure 2B). Again, having high job control was associated with better psychological health when individuals engaged in an active coping style. Thus, the hypothesis was supported. As was the case with social support and active coping, trying to cope actively while perceiving high demands and low job control was associated with even more health problems than not trying to cope actively (1.63 in Figure 1A vs. 1.33 in Figure 1B).

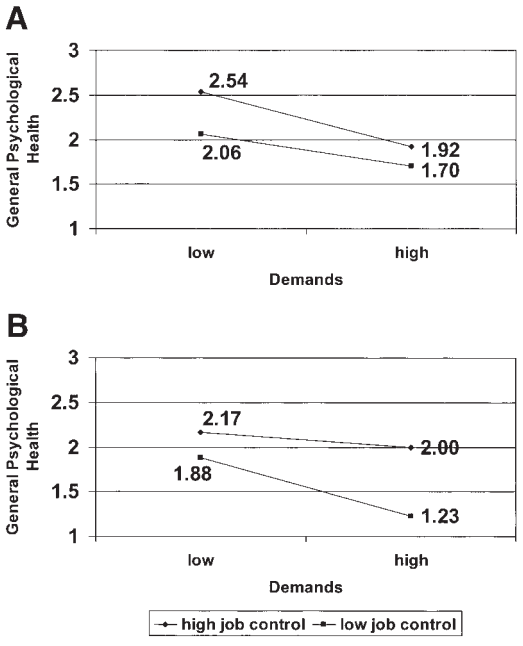

Figure 1. A: Low social support and active coping. B: High social support and active coping.

Table 5 presents the results for the analysis of the wishful thinking coping factor as a variable in the demand–control model. The three-way interaction of coping style, demands, and job control was not significant. The second hypothesis was not supported.

When religious coping was used as a boundary variable to the Karasek demand–control model, the interaction term was also not significant (see Table 6). Nevertheless, there was a main effect for religious coping ($\beta = .11$, $p < .01$) such that soldiers who used high levels of religious coping reported better psychological health.

To summarize, the hypotheses regarding the boundary conditions of the Karasek model were partially supported when predicting general psychological health. Job control only buffered the relationship between demands and general psychological health when peacekeepers engaged in an active coping style (i.e., social support and active coping and bright-side coping). No significant three-way interactions occurred for passive coping and religious coping.

Table 4
Hierarchical Regression Analyses for a Three-Way Interaction of Bright-Side Coping Predicting General Psychological Health

Variable	*B*	*SE B*	β	R^2 change	*p*
Step 1 on GHQ				.12	.00
Time 1 General psychological health	.24	.04	.25		.00
Step 2 on GHQ				.13	.00
Demands	−.11	.02	−.26		.00
Job control	.09	.02	.21		.00
Bright-side coping	.05	.02	.12		.00
Step 3 on GHQ				.01	.25
Demands × Job Control	.02	.02	.05		.15
Demands × Bright-Side Coping	−.02	.01	−.05		.18
Job Control × Bright-Side Coping	.01	.01	.04		.28
Step 4 on GHQ				.01	.01
Demands × Job Control × Bright-Side Coping	.03	.01	.10		.01

Note. General Health Questionnaire (GHQ) adjusted $R^2 = .26$; $F(8, 600) = 27.67$, $p < .01$.

Discussion

In this field study with U.S. soldiers deployed on a peacekeeping mission, coping style affected the demands–control–health relationship and was identified as a boundary condition of the Karasek demand–control model. Only when peacekeepers engaged in an active coping style (i.e., social support and active coping, bright-side coping) did job control buffer the relationship between demands and general psychological health. The hypothesis regarding passive coping and the impact of job control on the demand–health relationship was not supported. That is, when peacekeepers engaged in passive coping, job control was not a statistically significant moderator of the demands–strain relationship. In terms of the research question regarding the role of religious coping in the demand–control model, there was no significant moderating effect. Taken together, these results demonstrate that social support and other active coping strategies affect the influence of job control on the demands-health relationship.

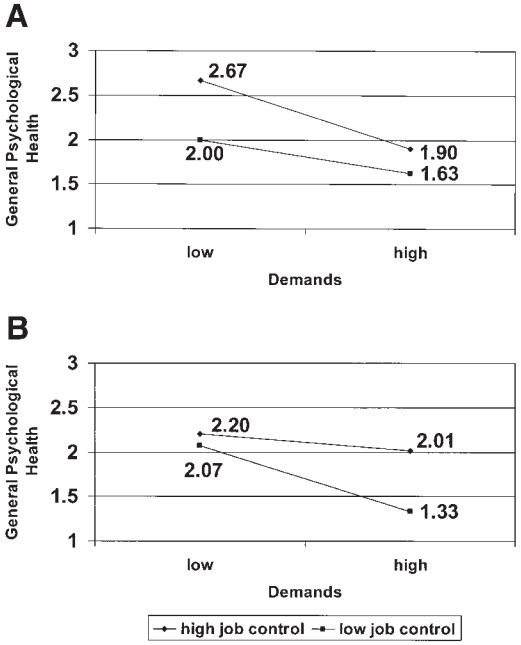

Figure 2. A: Low bright-side coping. B: High bright-side coping.

The role of coping as a boundary condition for the model builds on previous research that identified other individual differences extending the Karasek model (Schaubroeck, Jones, & Xie, 2001; Schaubroeck & Merritt, 1997). The results of the present study further bolster the position that boundary conditions do indeed exist, and they help to explain the conditions under which the demand–control relationship operates. Individual difference variables such as self-efficacy, perceptions of supervisor support, and individual coping may also help explain equivocal findings in demand–control research.

In understanding the impact of job control, it is especially critical to consider how individuals approach their problems under conditions of high demands. Workers must be inclined to use their appraised job control in order to take advantage of its

Table 5
Hierarchical Regression Analyses for a Three-Way Interaction of Wishful Thinking Coping Predicting General Psychological Health

Variable	*B*	*SE B*	β	R^2 change	*p*
Step 1 on GHQ				.12	.00
Time 1 General psychological health	.23	.03	.24		.00
Step 2 on GHQ				.16	.00
Demands	−.07	.02	−.15		.00
Job control	.08	.02	.18		.00
Wishful thinking	−.09	.02	−.22		.00
Step 3 on GHQ				.02	.00
Demands × Job Control	.00	.02	−.01		.82
Demands × Wishful Thinking	−.06	.02	−.13		.00
Job Control × Wishful Thinking	.02	.02	.06		.15
Step 4 on GHQ				.00	.09
Demands × job control × wishful thinking	.02	.01	.07		.09

Note. General Health Questionnaire (GHQ) adjusted $R^2 = .31$; $F(8, 600) = 33.84$, $p < .01$.

benefits. To the extent that workers feel they have some autonomy in how tasks are completed and decisions are made, individuals who are active copers may benefit from such autonomy. Individuals who are not active copers do not appear to reap the benefits from their perceived job control.

Additionally, within each coping style, high or low job control also seem to have effects of different importance to the strain outcome. As the results in the present study suggest, active coping is not beneficial for individuals who experience low job control. The effect of different amounts of perceived job control within a specific personality characteristic (e.g., coping style) should be investigated in further analyses.

Past researchers who have used Karasek's demand–control model have recommended increasing job control and autonomy in order to reduce worker health problems in stressful situations (e.g., Schaubroeck & Merritt, 1997). This is of limited value for two reasons: the individual may not be inclined to use active coping, as already discussed, and it may not be possible to increase the actual amount of job control but rather the individual's perceptions of it. As Averill (1973) noted, one aspect of job control is the degree to which a worker has discretion over the types of behaviors needed to complete a task. In hierarchical work settings such as the military, workers (e.g., soldiers) may not be afforded the flexibility to determine how a task is performed. Thus, proposing that organizations

Table 6
Hierarchical Regression Analyses for a Three-Way Interaction of Religious Coping Predicting General Psychological Health

Variable	*B*	*SE B*	β	R^2 change	*p*
Step 1 on GHQ				.12	.00
Time 1 General psychological health	.25	.04	.26		.00
Step 2 on GHQ				.14	.00
Demands	−.11	.02	−.25		.00
Job control	.09	.02	.22		.00
Religious coping	.05	.02	.11		.00
Step 3 on GHQ				.00	.75
Demands × Job Control	.02	.02	.04		.27
Demands × Religious Coping	.00	.02	.01		.88
Job Control × Religious Coping	.01	.02	.01		.54
Step 4 on GHQ				.00	.07
Demands × Job Control × Religious Coping	.03	.01	.07		.07

Note. General Health Questionnaire (GHQ) adjusted $R^2 = .25$; $F(8, 600) = 26.41$, $p < .01$.

merely increase worker job control may not be a reasonable recommendation across all situations.

Study Limitations

There are limitations to this study that need to be addressed. First, self-report data, like in all survey research, can be biased by affective response set and retrospective recall. In the present study, we controlled for individual differences in affective response set by partialing out the effects of baseline psychological health from the analyses. Moreover, previous research with military personnel has shown that retrospective recall of military events such as exposure to deployment stressors is not necessarily biased (Bramsen, Dirkzwager, van Esch, & van der Ploeg, 2001; Schlenger et al., 1992).

Second, interactions found in this study all accounted for a 1% change in the explained variance. Adding the product term of the moderator into the regression equation did not remarkably reduce the model error. As Evans (1985) has argued, interaction effects in field studies are so difficult to find that even a 1% change of variance should be considered important. In comparison to optimally designed experiments, field studies are also at a disadvantage in terms of assessing the efficiency of higher order interaction terms (i.e., three-way interactions) as reported by McClelland and Judd (1993).

Third, the generalizability of the results should be viewed with caution. The coping factors accounted for 56% of the variance, which might indicate that the factor structure does not reflect the soldiers' coping styles properly. In addition, the degree to which the coping factor structure found in this study applies to other organizational settings or even to other military deployments such as combat is unclear.

The constellation of work demands that exist in different organizational settings must also be taken into account. Because of the unique work environment of peacekeepers, the operational definition of work demands includes demands encountered in executing a specific task and demands encountered because of the deployed environment itself. This expanded definition may also limit the generalizability of the findings to other job settings. However, it is important to consider the unique constellation of job demands for specific job fields in testing demand–control model.

In addition, the participants in the present study were predominantly men. An analysis of whether coping strategies and buffering effects differed from that of women could therefore not be conducted. This too may limit the generalizability of the results.

Finally, we only measured one component of job control here, namely, job autonomy. The issue of how to best operationalize job control is debated in the literature, although there is a trend to conceptualize job control as job autonomy (cf. Sauter et al., 1989). Still, by focusing on job autonomy, we may have missed other critical components of job control. In the present study, job autonomy was measured with items that primarily assessed freedom from supervision. These items may limit the extent to which all facets of job autonomy are examined. For example, the items in the scale we used do not directly assess the degree to which the individual has control over the procedures used in determining how a task should be performed.

Future Directions

The results of this study reaffirm that other variables need to be accounted for in understanding Karasek's demand–control model. Research that continues to examine other individual difference can extend the utility of the model in determining how worker health is affected by high job demands. Other aspects of the model should be clarified in future studies. One of the priorities for future research is to assess the best and most meaningful operationalization of job control because of its potential explanatory value. Future research needs to clarify the degree to which job control is best measured as a reflection of workers' subjective perceptions of the work environment, a result of their supervisors' managerial style, a relatively objective assessment of decision latitude, or some combination of these approaches. Other components of the model that need to be clarified include the role of job complexity and the seniority of the worker in influencing how workers respond to high job demands. Additionally, the degree to which coping style is a boundary condition to the demand–job control model needs to be confirmed especially in terms of the roles of passive and religious coping. Finally, a multilevel approach as previously demonstrated by Bliese and Castro (2000) should be used to replicate and extend the Karasek model. Especially for work settings such as the military that rely on nested subgroups of workers (e.g., platoons), measuring individual-level data neglects to account for the role of the group or contextual factors in determining how stress affects health outcomes. Multilevel models, however, account for variance

explained by group membership and thus may lead to more accurate models.

Beyond the theoretical considerations taken into account in extending demand–control research, there is also the applied question of what impact the type of military deployment may have on the role of coping strategies in affecting the demand–control relationship. For example, on average, soldiers in the present study rated the peacekeeping deployment demands as low to moderate. When the interaction terms were graphed, the soldiers we identified as high on deployment stressors reported at least moderate demands, but the intensity of the demands is still likely to be far more extreme on a combat deployment. The conceptualization of high demands in the present study is relative to the other scores on the stress scale, just as researchers have conceptualized stress in other studies of the demand–control model (Karasek, 1979; Schaubroeck, Jones, & Xie, 2001.). However, we are unaware of studies that have tested the Karasek model in a work environment with demands that are clearly and definitively stressful. The military setting provides an excellent opportunity for this kind of research because military personnel perform their duty in a range of environments (e.g., garrison, training, combat, peacekeeping). By examining the impact of coping with combat-related stressors on the demand–control model in combat, the boundary conditions can be further identified.

Other applied studies need to examine whether it is possible to increase the perception of job control in a hierarchical organization like the military. For many jobs in the military, there are rigid tasks, conditions, and standards of performance that are required to execute a given job but do not lend themselves well to individualized control. It may be possible to train supervisors to resist micromanagement and to encourage worker perceptions of autonomy by highlighting what soldiers do in fact have control over. Within a highly structured work environment, the military organization can also support this enhanced perception of job control by emphasizing the individual's responsibility in executing assigned tasks.

Besides encouraging job control, another way to enhance individual adaptation would be to encourage the individual coping strategies for dealing with high job demands. In situations in which a high degree of job control cannot be guaranteed and thus is unlikely to be perceived by soldiers, research is needed to identify alternative coping strategies that would buffer the effects of high job demands. For instance, active coping strategies that incorporate social support and cognitive and behavioral elements need to be adapted for situations where there is little job control. These and other methods of adapting worker and leader training are potential interventions that might benefit individual health and well-being.

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